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WILLIAM L. BERG
President and CEO

February 14, 2001

In reply, please refer to LAC-13733

DOCKET NO. 50-409

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Dairyland Power Cooperative
La Crosse Boiling Water Reactor (LACBWR)
Possession-Only License DPR-45
Annual Decommissioning Plan Revision

REFERENCES: (1) DPC Letter, Taylor to Document Control Desk, LAC-12460, dated December 21, 1987 (original submittal of LACBWR's Decommissioning Plan)
(2) NRC Letter, Erickson to Berg, dated August 7, 1991, issuing Order to Authorize Decommissioning of LACBWR
(3) NRC Letter, Brown to Berg, dated September 15, 1994, modifying Decommissioning Order

The annual update of the LACBWR Decommissioning Plan has been completed, and the pages with changes and their explanations are included with this letter. Each page with a change will have a bar in the right-hand margin to designate the location of the change. None of the changes was determined to require prior NRC approval, and they have been reviewed by both onsite and offsite review committees.

The individual pages requiring revision are attached to this letter. Please substitute these revised pages in your copy(ies) of the LACBWR Decommissioning Plan.

Reasons for the changes are as follows:

Page 4-1 Section 4.1, General Plant Description: the tense of the verb is changed so that the description will remain unchanged as unused systems, structures and components are removed.

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| Page 4-4 | Section 4.2.2, Turbine Building: the tense of the verb is changed so that the description will remain unchanged as unused systems, structures and components are removed. |
| Page 4-4 | Section 4.2.3, Waste Treatment Building and LSA Storage Building: minor wording change to reflect the fact that the unused high integrity disposal liner referred to in this section has been removed. |
| Page 5-16 | Section 5.2.14, Shutdown Condenser System: The system has been removed, the system description is retained with the tense of the verb being changed to past. The System Status is updated to state that the system is removed. |
| Page 5-30 | Section 5.2.28, Turbine Oil and Hydrogen Seal Oil System: System Status is updated to include the fact that the turbine oil reservoir, clean and dirty oil tanks have been drained. |
| Page 5-32 | Section 5.2.30, Waste Collection Systems: The last paragraph of the description is rewritten to more clearly explain spent resin handling. |
| Page 5-36 | Section 5.2.33.3, Emergency Diesel Generators 1A and 1B: A description of a new power feed from the LACBWR 1B Essential bus to the Genoa # 3 Generating Station (G-3) is added at the end of the section. This feed makes available to G-3 surplus Diesel Generator capacity. It will provide G-3 an alternate source of energy to supplement their plant batteries during an emergency shutdown with subsequent plant blackout. |
| Page 6-4 | Section 6.2, Organization and Responsibilities: In the last paragraph the reference to Technical Specifications is replaced with reference to the Quality Assurance Program Description (QAPD). Safety Review Committee and Operations Review Committee requirements were transferred from Technical Specifications to the QAPD with the issuance of Amendment #69 to the LACBWR Technical Specifications. |
| Page 6-14 to 6-18 | Section 6.9, SAFSTOR Fire Protection Program: This entire section has been rewritten to be consistent with the LACBWR Fire Protection Plan. The fire protection program was updated based on Draft Regulatory Guide DG-1069, "Fire Protection Program for Nuclear Power Plants During Decommissioning and Permanent Shutdown," and National Fire Protection Association (NFPA) standards. This revision established a change in conduct of the fire brigade at LACBWR. NFPA 600, 1996 Edition, Standard on Industrial Fire Brigades provides the fire brigade organizational basis at LACBWR and the requirements set forth in the standard have been used to establish fire brigade organization, conduct and limits, which clearly define incipient fire fighting duties. All aspects of the fire protection program and its performance-based components have been reviewed and revised to more adequately comply with the requirements contained in applicable NFPA standards. |

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| Page 6-19 | Section 6.11, Records: This section was re-edited to clearly indicate that decommissioning records are maintained under provisions of the Quality Assurance Program, as are the other records at LACBWR. |
| Page 7-4 | Section 7.3.4, Testing and Maintenance Program to Maintain Systems in Use: A paragraph is added to this section to include discussion of the implementation of the Maintenance Rule. |
| Page 9-2 to 9-3 | Section 9.2, Spent Fuel Handling Accident: A statement is added at the end of the first paragraph pertaining to the Curie content remaining as of October 2000. Added to the original calculated values for Whole Body Dose and Skin Dose are the values as of October 2000. |
| Page 9-4 | Section 9.3, Spent Fuel Handling Accident: A statement is added at the end of the second paragraph pertaining to the Curie content remaining as of October 2000. Added to the original calculated values for Whole Body Dose and Skin Dose are the values as of October 2000. |

LACBWR Initial Site Characterization Survey for SAFSTOR

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| Cover Page | Update revision date. |
| Page 11 | The note at the bottom of the page referring to attachment 3 is deleted because attachment 3 is being deleted. |
| Page 15 | Attachment 4 is renumbered to 3; note at bottom of this page is corrected to reflect this change. |
| Pages 24 to 29 | New pages 24 to 28. Attachment 3, Plant Loose Surface Contamination, is deleted as it provides no useful information. Pages and Attachment 4 are renumbered. Attachments have been decay-corrected to January 2001 and replace previous attachments, which were decay-corrected to January 1998. |

If you have any questions concerning any of these changes, please contact Michael Johnsen of my staff at 608-689-4210.

Sincerely,

DAIRYLAND POWER COOPERATIVE

William L Berg

William L. Berg, President & CEO

WLB:MNJ:dh
Enclosures
cc: Richard Dudley, NRC Project Manager

*NRC Docket No. 50-409*

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TO: NRC Washington CONTROLLED DISTRIBUTION NO. 53

FROM: LACBWR Plant Manager March 1, 2001

SUBJECT: Changes to LACBWR Controlling Documents

I. The following documents have been revised or issued new.

**DECOMMISSIONING PLAN**, revised January 2001

Instructions:

Remove and replace the following pages:

Title Page
4-1 and 4-4
5-16, 5-30, 5-32, 5-36
6-4, 6-14 thru 6-19
7-4
9-2 thru 9-4

Remove and replace the following pages in the Initial Site Characterization Survey:

Title Page
11
15
24 thru 28 Remove & discard page 29.

☒ The material listed above is transmitted herewith. Please verify receipt of all listed material, destroy superseded material, and sign below to acknowledge receipt.

☐ The material listed above has been placed in your binder.

☐ Please review listed material, notify your personnel of changes, and sign below to acknowledge your review and notification of personnel. [To be checked for supervisors for department specific procedures and LACBWR Technical Specifications.]

☐ The material listed above has been changed. [To be checked for supervisors when materials applicable to other departments are issued to them.]

/S/________________________ DATE__________________

Please return this notification to the LACBWR Secretary within ten (10) working days.

# LA CROSSE BOILING WATER REACTOR

# (LACBWR)

# D E C O M M I S S I O N I N G

# P L A N

Revised
January 2001

DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
4601 State Road 35
Genoa, WI 54632-8846

# 4. FACILITY DESCRIPTION

## 4.1 GENERAL PLANT DESCRIPTION

The LACBWR was a nuclear power plant of nominal 50 Mw electrical output, which utilizes a forced-circulation, direct-cycle boiling-water reactor as its heat source.

The reactor and its auxiliary systems were within a steel containment building. The turbine-generator and associated equipment, the control room for both turbine and reactor controls, and plant shops and offices were in a conventional building adjacent to the containment building.

Miscellaneous structures which were associated with the power plant, and were located adjacent to the Turbine Building, include the electrical switchyard, Cribhouse, Waste Treatment Building, LSA Storage Building, oil pump house, stack, warehouses, administration building, annex building, guard house, outdoor fuel oil tanks, underground septic tanks, gas storage tank vaults, underground oil tanks and the condenser circulating water discharge seal well at Genoa Unit 3.

Miscellaneous onsite improvements included roads, walks, parking areas, yard lighting, fire hydrants required for plant protection, access to and use of rail siding facilities, fencing, landscaping, and communication services.

## 4.2 BUILDING AND STRUCTURES

### 4.2.1 Containment Building

The containment building (Figs. 4.1 and 4.2) is a right circular cylinder with a hemispherical dome and semi-ellipsoidal bottom. It has an overall internal height of 144 ft. and an inside diameter of 60 ft., and it extends 26 ft. 6 in. below grade level. The shell thickness is 1.16 in., except for the upper hemispherical dome which is 0.60 in. thick.

The building contained most of the equipment associated with the nuclear steam supply system, including the reactor vessel and biological shielding, the fuel element storage well, the forced circulation pumps, the shutdown condenser, and process equipment for the reactor water purification system, decay heat cooling system, shield cooling system, seal injection system, emergency core spray system, boron injection system, and storage well cooling system.

The containment building was designed to withstand the instantaneous release of all the energy of the primary system to the containment atmosphere at an initial ambient temperature of 80°F, neglecting the heat losses from the building and heat absorption by internal structures. Its design pressure is 52 psig, compared to a calculated maximum pressure buildup of 48.5 psig following the maximum credible accident while in operation. The containment building shell is designed and constructed according to the ASME Boiler and Pressure Vessel Code, Sections II, VIII, and IX, and Nuclear Code Cases 127ON, 1271N, and 1272N.

### 4.2.2 Turbine Building

The general location of the Reactor and Turbine Buildings is shown in Figure 4.3. The Turbine Building contained a major part of the power plant equipment. The turbine-generator was on the main floor. Other equipment was located below the main floor. This equipment includes the feedwater heaters, reactor feedwater pumps, air ejector, vacuum pump, full-flow demineralizers, condensate pumps, air compressors, air dryer, oil purifier, service water pumps, component cooling water coolers and pumps, demineralized water system, domestic water heater, turbine oil reservoir, oil tanks and pumps, turbine condenser, unit auxiliary transformer, 2400-volt and 480-volt switchgear, motor control centers, diesel engine-generator sets, emergency storage batteries, inverters and other electrical, pneumatic, mechanical and hydraulic systems and equipment required for a complete power plant. A 30/5-ton capacity, pendant-operated overhead electrical traveling crane spanned the Turbine Building. The crane has access to major equipment items located below the floor through numerous hatches in the main floor. A 40-ton capacity, pendant-operated overhead electric crane spanned the space between turbine building loading dock and Waste Treatment Building.

The Turbine Building also contained the main offices, the Control Room (for both turbine-generator and reactor), locker room facilities, laboratory, shops, counting room, personnel change room, and decontamination facilities, heating, ventilating and air conditioning equipment, rest rooms, storeroom,, and space for other plant services. In general, these areas were separated from power plant equipment spaces. The Control Room is on the main floor on the side of the Turbine Building that is adjacent to the Containment Building. The general arrangement of the Containment and Turbine Buildings is shown in Figures 4.3 through 4.5.

### 4.2.3 Waste Treatment Building and LSA Storage Building

The Waste Treatment Building (WTB) is located to the northeast of the Containment Building. The building contains facilities and equipment for decontamination and the collection, processing, storage, and disposal of low level solid radioactive waste materials in accordance with the Process Control Program.

The grade floor of the Waste Treatment Building contains a shielded compartment which encloses a 320 $ft^3$ stainless steel spent resin receiving tank with associated resin receiving and transfer equipment. A high integrity disposal liner can be located in the adjacent shielded cubicle.

Adjacent to these shielded resin handling cubicles are two open cubicles, one of which is about 3' above grade. The grade level area contains two back-washable radioactive liquid waste filters, the spent resin liner level indication panel and the spent resin liner final dewatering piping, container, and pumps. The second above-grade area is a decontamination facility, consisting of a steam cleaning booth, a decontamination sink, and heating/ventilation/air conditioning units.

### 5.2.14 Shutdown Condenser System

The primary function of the Shutdown Condenser was to provide a backup heat sink for the reactor, in the event the reactor was isolated from the main condenser, by the closure of either the Reactor Building Steam Isolation valve or the Turbine Building Steam Isolation valve. In addition, the Shutdown Condenser acted as an over-pressure relief system in limiting over-pressure transients.

The Shutdown Condenser was located on a platform 10 feet above the main floor in the Reactor Building. Steam from the 10-inch main steam line passed through a 6-inch line, two parallel inlet steam control valves, back to a 6-inch line and into the tube side of the condenser where it was condensed by evaporating cooling water on the shell side. The steam generated in the shell was exhausted to the atmosphere through a 14-inch line which penetrates the Reactor Building. An area monitor was located next to the steam vent line near the containment shell penetration in order to detect excessive activity release in the event of Shutdown Condenser tube failures. The main steam condensate was collected in the lower section and returned to the reactor vessel by gravity flow. The condensate line leaving the condenser was a 6-inch line along the horizontal run and was reduced to four inches for the vertical section. Two parallel condensate outlet control valves were located in the 4-inch return line. The condensate line also contained two 2-inch vent lines which join together and return to the lower section of the condenser for returning any vapors and/or non-condensible gases which were carried into the condensate line to prevent perturbations in the condensate flow leaving the condenser. The lower section in turn was vented to the offgas system through a 1-inch vent line. Flow in this vent line was restricted by a 1/16th-inch orifice, which was built into and was an integral part of the shutdown condenser offgas control valve seat.

A vent line containing two parallel control valves was connected to the 6-inch condensate return line. The valves discharge directly to the Reactor Building atmosphere and were capable of remote manual operation to vent the primary system directly to the Reactor Building atmosphere under emergency conditions. They performed the function of "Reactor Emergency Flooding Vent Valves" to equalize water level in the building with that in the reactor vessel, for a below-core break, and "Manual Depressurization System (MDS)" to rapidly depressurize the reactor vessel, on failure of the HPCS coincident with a major leak.

#### System Status

This system has been removed.

### 5.2.28 Turbine Oil and Hydrogen Seal Oil System

The Turbine Bearing Oil System receives cooled oil from the lube oil coolers to supply the necessary lubricating and cooling oil (via a bearing oil pressure regulator) to the turbine and generator bearings, exciter bearings, and exciter reduction gear. During normal operation, the necessary oil pressures are provided by the attached lube oil pump. During startup and shutdown, an ac motor-driven auxiliary lube oil pump provides oil pressure. Backup protection consists of the ac turbine bearing oil pump and the dc emergency bearing oil pump.

The Hydrogen Seal Oil System receives cooled oil from the lube oil coolers; and it supplies this oil, via a pressure regulator, to the inboard and outboard hydrogen seals of the generator. Backup protection is provided in the event the normal supply pressure drops or is lost, with an ac hydrogen seal oil pump and a dc emergency hydrogen seal oil pump.

Flexibility of the Turbine Oil Transfer System is brought about by the piping arrangement that allows the lubricating oil to be transferred or purified from several sources. With the lube oil transfer pump, turbine oil may be transferred from the lube oil reservoir to either the clean oil or dirty oil tanks located in the oil storage room.

System Status

This system is not required to be operational. Turbine oil reservoir, clean and dirty oil tanks are drained.

### 5.2.30 Waste Collection Systems

The functions of the Waste Collection and Treatment System are:

(1) To collect and store radioactive liquid waste generated in the plant.

(2) To collect and transfer depleted ion exchange resins to a shipping container.

(3) To process the collected waste as required for safe and economical disposal.

The Turbine Building Waste Collection System collects the liquid waste from the Turbine Building, the Waste Treatment Building, the waste gas storage vault, and the tunnel area in two storage tanks (one 4500 gal. and one 3000 gal.) located in the tunnel between the Reactor Building and the Turbine Building.

The Reactor Building Liquid Waste System consists of two retention tanks, each with a capacity of 6000 gallons, a liquid waste transfer pump, two sump pumps, and the necessary piping to route the waste liquid to the retention tanks and from the retention tanks out of the Reactor Building.

After a tank's contents are recirculated, a sample is withdrawn from the tank and analyzed for radioactivity concentrations prior to discharge.

The total amount of liquid waste discharged to the circulating water discharge line is measured with a flow totalizer water meter which can handle flow rates up to 100 gpm and a flow rate monitor with Control Room readout.

Spent resin will be transferred to the spent resin receiving tank, where it will be held until there is a sufficient quantity available for shipment to an approved processing facility. The resin will be transferred to an approved shipping container where it will be dewatered and made ready for shipment.

System Status

The Waste Collection Systems are maintained operational.

The function of the 1A Diesel Generator is to supply emergency power to the 480-v Essential Bus 1A which, in turn, supplies power to the Turbine Building MCC 1A, the Turbine Building 120-v Bus, the Turbine Building 120-v Regulated Bus and the feed to the Regulated Bus Auxiliary Panel.

The 1B Diesel Generator System consists of a 400 kw diesel driven generator, a 300-gallon fuel oil day tank, fuel oil transfer system and external remote radiator and fan, a 200 kw fan-cooled test load, a local engine control and instrument cabinet, and remote instrumentation and controls in the Control Room. The diesel generator set is located in the Generator Room of the Diesel Building which is south of the Electrical Penetration Room at elevation 641 feet.

The function of the 1B Diesel Generator is to supply emergency power to the 480-v 1B Essential Bus, which in turn supplies power to the Reactor MCC 1A 480-v Bus, Diesel Building MCC 480-v Bus, and the loads supplied by these MCC.

A feed from 480-v Essential Bus 1B to Genoa #3 Generating Station (G-3) provides G-3 an alternate source of energy to supplement their plant's batteries during emergency shutdown with subsequent plant blackout.

5.2.33.4 <u>120-V Non-Interruptible Buses</u>

The 120-v Non-Interruptible Buses maintain a continuous non-interruptible power supply to a portion of the essential plant control circuitry, communications equipment and radiological monitoring equipment.

The 120-v Inverter 1A is designed for 3 KVA output and is powered by 125-v dc from the Reactor Plant Battery Bank through the Reactor Plant dc Distribution Panel. An automatic transfer switch is provided which will transfer the output to an alternate 120-v ac source in the event the inverter or its dc source fails. The alternate source for Inverter 1A is the Turbine Building 120-v Regulated Bus. The Inverter 1A is located in the Electrical Equipment Room.

The 120-v Non-Interruptible Bus 1B had the capability of being supplied with power from three sources. The normal main feed power source was supplied by Static Inverter 1B. The 5 KVA 1B Static Inverter was powered by 125-v dc from the Diesel Building Battery Bank through the Diesel Building 125-v dc Distribution Panel. Its alternate source was the Diesel Building MCC 480-v Bus through a static switch. The reserve feed power source was supplied by the Turbine Building 120-v Regulated Bus, through a breaker on TB MCC 1A, that was used when the Static Inverter 1B was out of service. Static Inverter 1B has been removed from service. The Non-Interruptible Bus 1B is now supplied from the Turbine Building 120-v Regulated Bus and has been renamed the Regulated Bus Auxiliary panel.

The 120-v Inverter 1C is powered by 125-v dc from the Generator Battery Bank through the Generator Plant dc Distribution Auxiliary Panel. An alternate 120-v ac source is supplied through a breaker on Turbine Building MCC 1A through a static switch in the inverter.

responsible for coordinating the development in-house of the procedures necessary to totally dismantle the facility once the fuel is shipped from site.

The Radiation Protection Engineer will be responsible for radiation protection, projections and trending. This engineer will be responsible for working with the Health and Safety Supervisor in preparing long-term prognosis for exposures and procedures necessary for decon, waste management, chemical control and fuel shipment. The Radiation Protection Engineer will assist in ensuring that an aggressive ALARA program is carried out and that contamination and background radiation exposure is reduced as low as reasonably achievable during the SAFSTOR period.

The Reactor Engineer will be responsible for all activities involving the stored fuel and will assist with plans for eventual decommissioning of the facility. This engineer will be responsible for any required reports to be generated on the stored special nuclear material.

The Safety Review Committee will remain the Offsite Review Group responsible for oversight of facility activities. It will have a quorum of 4 persons including the chairman. No more than a minority of the quorum shall have line responsibility for operation of the facility. The SRC shall meet at least once per year.

The Operations Review Committee (the Onsite Review Committee) will remain responsible for the review of day-to-day operations. It will consist of a quorum of at least 4 individuals drawn from the management staff at the site. It is chaired by the Plant Manager. The Safety Review Committee and the Operations Review Committee will review all material as required by the Quality Assurance Program Description (QAPD) including, but not limited to, facility changes, license amendments, and plan changes in Emergency Plan and Security Plan. The committees will also review any special tests.

## 6.3 CONTRACTOR USE

The use of contractors at LACBWR will continue as required throughout the SAFSTOR and DECON periods.

The use of contractors will be minimized and generally limited to areas of specialty which cannot be accomplished by Dairyland staff personnel. The use of contractors will be complementary in nature. It will highlight areas where DPC expertise or staffing is inadequate to perform specific tasks without outside help.

Contractor employment for specific tasks, possibly including monitoring or evaluating the facility during the SAFSTOR or aiding in dismantlement or cleanup during the DECON, will continue to be governed by the requirements of the LACBWR Quality Assurance Program.

The LACBWR Spent Fuel (333 assemblies) is stored under water in the high density spent fuel storage racks in the LACBWR Fuel Storage Well which is located adjacent to the reactor in the LACBWR containment building.

Additional small quantities of SNM are contained in neutron and calibration sources and in fission detectors which are appropriately stored at various locations in the LACBWR plant.

All fuel handling and all shipment and receipt of SNM is accomplished according to approved written procedures. Appropriate accounting records will be maintained and appropriate inventories, reports and documentation will be accomplished by or under the direction of the LACBWR Accountability Representative in accordance with the requirements set forth in 10 CFR 70, 10 CFR 73 and 10 CFR 74.

## 6.9 SAFSTOR FIRE PROTECTION

### 6.9.1 Fire Protection Plan

LACBWR can safely maintain and control the Fuel Element Storage Well in the case of the worst postulated fire in each area of the plant.

The fire protection plan at LACBWR is to minimize fire loads, identify and correct fire hazards, control ignition sources, detect incipient stage fires, and immediately extinguish incipient stage fires. A trained fire brigade shall be present at the facility at all times. A pressurized, water-based fire protection system comprised of automatic and manual sprinkler systems, fire hose stations, hydrants, and equipment shall be maintained at all times. Portable fire extinguishers shall be available in all areas of the facility. Unavailability of, or impairment to, fire protection equipment shall be compensated for. Fires that progress beyond incipient stage shall be responded to by outside fire services. This fire protection plan provides defense-in-depth to fire emergencies.

The goals of the fire protection plan at LACBWR are to prevent fire and to effectively respond to fire, in order to minimize the impact of fire emergencies and are met through accomplishing the following objectives:

- **Prevent fire**. With the cessation of plant operations, ignition sources have been greatly reduced. Welding and other hot work shall be performed only under Special Work Permit conditions and the use of a fire watch shall be required. Routine fire and safety inspections by LACBWR staff shall be conducted to identify fire hazards, the discovery of which would result in action to reduce those hazards. General cleanliness and good housekeeping shall continue as an established practice and shall be checked during inspection.

- **Detect fire**. A fire detection system is installed to detect heat and smoke in spaces and areas of the protected premises of LACBWR. If the fire detection system or components are unavailable, increased monitoring of affected areas by plant personnel shall be required.

- **Respond immediately to fire**. A fire brigade, available at all times, shall respond immediately to all fire emergencies to evaluate fire situations, to extinguish incipient stage fires, and to quickly assess the need for, and then summon, outside assistance. For any situation where a fire should progress beyond the incipient stage, qualified outside fire services shall provide assistance.

- **Suppress fire**. Areas of high fire loading are equipped with automatic reaction-type fire suppression systems or manually initiated fire suppression systems. These installed systems provide immediate fire suppression automatically or provide the means to extinguish fires without fire exposure to personnel manually initiating them. Fire barriers provide containment against the spread of fire between areas and provide protection to personnel responding to fire emergencies.

- **Have available necessary fire protection equipment**. Based on standards of fire protection, manual fire extinguishing equipment is installed in all areas of the LACBWR facility. This availability also requires that the equipment is maintained, inspected, and tested in accordance with established guidelines. Compensatory actions and procedures for the impairment or unavailability of fire protection equipment area provided.

### 6.9.2 Fire Protection Program

The fire protection program for the LACBWR facility is based on sound engineering practices and established standards. The function of the fire protection program is to provide the mechanisms by which the goals of the fire protection plan are accomplished. The fire protection program utilizes an integrated system of administrative controls, equipment, personnel, tests, and inspections. The fire protection program clearly defines personnel responsibilities. The fire protection program provides the specific means by which the processes of fire prevention and fire protection are implemented. Components of the fire protection program are:

6.9.2.1 Administrative Controls are the primary means by which the objective of fire prevention is accomplished. Administrative controls also ensure that fire protection program document content is maintained relevant to its fire protection function. By controlling ignition sources, combustible materials, and flammable liquids, and by maintaining good housekeeping practices, the probability of fire emergency is reduced. Procedures are routinely reviewed for adequacy and are revised as conditions warrant.

6.9.2.2 Fire Detection System. The LACBWR plant fire detection system is designed to provide heat and smoke detection. A Class B protected premises fire alarm system is installed which uses ionization or thermal-type fire detectors. Detectors cover areas throughout the plant and outlying buildings. The plant fire alarm system control panel is located in the Control Room. Alarms as a result of operation of a protection system or equipment, such as water flowing in a sprinkler system, the detection of smoke, or the detection of heat, are sounded in the Control Room. Alarm response is initiated from the Control Room.

The Administration Building fire detection system provides alarm functions using a combination of thermal detectors ionization detectors, and manual pull stations. Audible alarms are sounded throughout the building and provide immediate notice to occupants of fire emergency. The control panel for the Administration Building fire detection system is located within the Security Electrical Equipment Room.

6.9.2.3 Fire Barriers are those components of construction (walls, floors, and doors) that are rated in hours of resistance to fire by approving laboratories. Any openings or penetrations in these fire barriers shall be protected with seals or closures having a fire resistance rating equal to that of the barrier. The breaching of fire barriers is administratively controlled to ensure their fire safety function is maintained.

6.9.2.4 Fire Suppression Water System. The fire suppression water system is designed to provide a reliable supply of water for fire extinguishing purposes in quantities sufficient to satisfy the maximum possible demand. Fire suppression water is supplied by the High Pressure Service Water System (HPSW) which is normally pressurized from the Low Pressure Service Water (LPSW) system. Two HPSW diesel pumps provide fire suppression water when started manually or when started automatically by a decrease in HPSW pressure to <60 PSIG. Fire suppression water can be supplied from Genoa Station No. 3 (G-3) as a backup system to the HPSW system.

Fire suppression water is available from an external underground main at five 6-inch fire hydrants spaced at 200-foot intervals around the plant. Four outside hose cabinets contain the necessary hoses and equipment for hydrant operation.

Fire suppression water is available at five hose cabinets in the Turbine Building, one hose reel in the 1B Diesel Generator Building, and one hose cabinet in the Waste Treatment Building. Fire suppression water is available from hose reels located on each of four levels in the Containment Building.

Fire suppression water is also supplied to sprinkler systems in areas with high fire loads. Sprinkler systems suppress fire in these areas without exposure to personnel. Automatic sprinkler systems are installed in the Oil Storage Room and in the Crib House HPSW diesel pump and fuel tank area. A manually initiated sprinkler system is installed in 1A Diesel Generator Room. An automatic reaction-type deluge system protects the Reserve Auxiliary Transformer located in the LACBWR switchyard.

6.9.2.5 Automatic Chemical Extinguishing Systems are installed in two areas of LACBWR containing high fire loads. The 1B Diesel Generator Room is protected by a $CO_2$ Flooding system. The Administration Building Records Storage Room is protected by a Halon system. These systems automatically extinguish fire using chemical agents, upon detection by their associated fire protection circuits. Fire in these areas is extinguished without exposure to personnel.

6.9.2.6 <u>Portable Fire Extinguishers and Other Fire Protection Equipment</u>. An assortment of dry chemical, CO2, and Halon portable fire extinguishers rated for Class A, B, and C fires are located throughout all areas of the LACBWR facility. These extinguishers provide the means to immediately respond to incipient stage fires. Spare fire extinguishers are located on the Turbine Building grade and main floors.

Portable smoke ejectors are provided for the removal of smoke and ventilation of spaces. Smoke ejectors are located in the Change Room, on the Turbine Building mezzanine floor, and in the Maintenance Shop.

Four outside hose cabinets contain necessary lengths and sizes of fire hose for use with the yard fire hydrants. These hose cabinets also contain hose spanner and hydrant wrenches, nozzles, gate valves, coupling gaskets, and ball-valve wye reducers.

Took kits are located in the Crib House outside fire cabinet and in the Maintenance Shop. Spare sprinkler heads and other sprinkler equipment is located in the Change Room locker. Rechargeable flashlights are wall-mounted in various locations and at entries to spaces. Portable radios are available at various locations and used for Fire Brigade communication.

6.9.2.7 <u>The Fire Brigade</u> is an integral part of the fire protection program. The Fire Brigade at LACBWR shall be organized and trained to perform incipient fire fighting duties. Personnel qualified to perform Operations Department duties and all LACBWR Security personnel shall be designated as Fire Brigade members and trained as such. Fire Brigade responsibilities shall be assigned to members of these groups while on duty.

The Fire Brigade shall be a minimum of two people at all times. The Duty Shift Supervisor (or his designee) shall respond to the fire scene as the Fire Brigade Leader. One member of the Security detail shall respond, as directed by the Fire Brigade Leader, and perform duties as the second Fire Brigade member.

The Control Room Operator shall communicate the status of fire detection system alarms or specific hazard information with the Fire Brigade, shall monitor and maintain fire header water pressure, and shall expeditiously summon outside fire service assistance as directed by the Fire Brigade Leader. The Control Room Operator shall use the page system to announce reports of fire, evacuation orders, and other information as requested by the Fire Brigade Leader.

6.9.2.8 <u>Outside Fire Service Assistance</u>. The LACBWR Fire Brigade is organized and trained as an incipient fire brigade. Fire Brigade Leaders are responsible for recognizing fire emergencies that progress beyond the limits of incipient stage fire fighting. Fire Brigade Leaders shall then immediately request assistance from outside fire services.

The LACBWR Emergency Plan contains a letter of agreement with the Genoa Fire Department. This letter of agreement states that the Genoa Fire Department is responsible for providing rescue and fire fighting support to LACBWR during emergencies. Upon request by the Genoa

Fire Chief, all fire departments of Vernon County can be coordinated and directed by the Fire Services Director for Vernon County Emergency Management to support the Genoa Fire Department during an emergency at LACBWR.

6.9.2.9 Reporting. Fire emergencies shall be documented under the following reporting guidelines:

- Any fire requiring Fire Brigade response shall be reported by the Duty Shift Supervisor using a LACBWR Incident Report.
- Any fire requiring outside fire service assistance shall require activation of the Emergency Plan and shall require declaration of Unusual Event.

6.9.2.10 Training. Unescorted visitors and contractors located at LACBWR shall receive indoctrination in the areas of fire reporting, plant evacuation routes. fire alarm response, and communications systems under General Employee Training.

Personnel who work routinely at LACBWR, and are given basic practical fire fighting instruction annually, are termed designated employees.

In addition to the annual practical fire fighting instruction, Fire Brigade members shall receive specific fire protection program instruction and participate in at least one drill annually.

Personnel not subject to Fire Brigade responsibilities shall receive training prior to performing fire watch duties.

6.9.2.11 Records. Fire Protection records shall be retained in accordance with Quality Assurance records requirements.

## 6.10 SECURITY DURING SAFSTOR AND/OR DECOMMISSIONING

During the SAFSTOR status associated with the LACBWR facility, security will be maintained at a level commensurate with the need to insure safety is provided to the public from unreasonable risks.

Guidance and control for security program implementation are found within the LACBWR Security, Safeguards Contingency, and Guard Force Training and Qualification Plans, along with the Security Control Procedures.

## 6.11 RECORDS

The Quality Assurance Program Description (QAPD) establishes measures for maintaining records which cover all documents and records associated with the decommissioning, operation, maintenance, repair, and modification of structures, systems, and components covered by the QAPD.

Any records which are generated for the safe and effective decommissioning of LACBWR will be placed in a file explicitly designated as the decommissioning file.

Examples of records which would be required to be placed in the decommissioning file are:

- Records of spills or spread of radioactive contamination, if residual contamination remains after cleanup.
- Records of contamination remaining in inaccessible areas.
- Plans for decontamination (including processing and disposal of wastes generated).
- Base line surveys performed in and around the LACBWR facility.
- Analysis and evaluations of total radioactivity concentrations at the LACBWR facility.
- Any other records or documents, which would be needed to facilitate decontamination and dismantlement of the LACBWR facility and are not controlled by other means.

Asbestos removed from plant systems will be handled in accordance with the Dairyland Power Cooperative asbestos control program.

### 7.3.3 Research

During the SAFSTOR period, an Aging Research Program may be conducted. This program may entail records research and possible removal of unused components for testing.

### 7.3.4 Testing and Maintenance Program to Maintain Systems in Use

During the SAFSTOR period, a testing and maintenance program will continue for those systems previously designated as being required for SAFSTOR. Routine preventive maintenance will be performed as before, but where the present maintenance interval is listed as "Outage," a new interval will be specified. Corrective maintenance will be performed as necessary. Instrument calibrations and other routine testing will continue as before for equipment which will be required to be operable.

LACBWR has established a program implementing the maintenance rule. This program contains key aspects of the maintenance rule. Included are those aspects specifically necessary to adequately identify structures, systems, and components (SSCs) to be monitored under the rule, establish goals and implement monitoring for those SSCs.

## 7.4 PLANT MONITORING PROGRAM

Activities and plant conditions at LACBWR will continue to be maintained to protect the health and safety of both the public and plant workers. Baseline radiation surveys have been performed to establish the initial radiological conditions at LACBWR during SAFSTOR. An in-plant as well as offsite surveillance program will be established and maintained to assure plant conditions are not deteriorating and environmental effects of the site are negligible.

### 7.4.1 Baseline Radiation Surveys

Baseline surveys have been performed to establish activity levels and nuclide concentrations throughout the plant and surrounding area. These surveys included:

a) Specific area dose rates and contamination levels.
b) Specified system piping and component contact dose rate.
c) Radionuclide inventory in specified plant systems.
d) Radionuclide concentration in the soil and sediment in close proximity of the plant.

Baseline conditions will be compared with routine monitoring values to determine the plant/ system trends during SAFSTOR. Some specific monitoring points may be reassigned during the SAFSTOR period if it is determined that a better characterization can be obtained based on radiation levels measured or due to decontamination or other activities which are conducted and experience achieved.

The assumptions used in evaluating this event during SAFSTOR were similar to those used in the FESW reracking analyses.[1,2] The fuel inventory calculated for October 1987 was used. The only significant gaseous fission product available for release is Kr-85. The plenum or gap Kr-85 represents about 15% (215.7 Curies) of the total Kr-85 in the fuel assembly. However, for conservatism and commensurate with Reference 1, 30% of the total Kr-85 activity, or 431.4 Curies, is assumed to be released in this accident scenario. (Due to decay, as of Oct. 2000 only 43.2% of this Kr-85 activity remains - 186.3 Curies.)

No credit was taken for decontamination in the FESW water or for containment integrity, so all the activity was assumed to be released into the environment. Meteorologically stable conditions at the Exclusion Area Boundary (1109 ft, 338m) were assumed, with a release duration of 2 hours commensurate with 10 CFR 100 and Regulatory Guides 1.24 and 1.25.

A stack release would be the most probable, but a ground release is not impossible given certain conditions. Therefore, offsite doses were calculated for 3 cases. The first is at the worst receptor location for an elevated release, which is 500m E of the Containment Building. The next case is the dose due to a ground level release at the Exclusion Area Boundary. The maximum offsite dose at the Emergency Planning Zone boundary[3] for a ground level release is also calculated. Adverse meteorology is assumed for all cases.

**Elevated Release**

Average Kr-85 Release Rate

$$\frac{431.4 \text{ Curies}}{2 \text{ hrs.} \times 3600 \text{ sec/hr}} = 6.00 \text{ E-2 Ci/sec}$$

Worst Case $\frac{X}{Q}$ for 0-2 hours at 500m E = 2.3 E-4 sec/m$^3$

Kr-85 average concentration at 500m E

$$6.00 \text{ E-2 Ci/sec} \times 2.3 \text{ E-4 sec/m}^3 = 1.38 \text{ E-5 Ci/m}^3$$

Immersion Dose Conversion at 500m E

Kr-85 Gamma Whole Body Dose Factor (Regulatory Guide 1.109)

$$1.61 \text{ E+1} \frac{\text{mRem/yr}}{\mu\text{Ci/m}^3} \times 10^6 \frac{\mu\text{Ci}}{\text{Ci}} \times 1.142 \text{ E-4} \frac{\text{yr}}{\text{hr}} = 1{,}839 \frac{\text{mRem/hr}}{\text{Ci/m}^3}$$

Whole Body Dose at 500m E

$$1839 \frac{\text{mRem/hr}}{\text{Ci/m}^3} \times 1.38 \text{ E-5 Ci/m}^3 \times 2 \text{ hr} = 0.05 \text{ mRem (as of 10/00 = 0.02 mRem)}$$

Kr-85 Beta/Gamma Skin Dose Factor (Regulatory Guide 1.109)

$$1.34\ E{+}3\ \frac{\text{mRem/yr}}{\mu\text{Ci/m}^3} \times \frac{10^6\mu\text{Ci}}{\text{Ci}} \times 1.142\ E{-}4\ \frac{\text{yr}}{\text{hr}} = 1.53\ E5\ \frac{\text{mRem/hr}}{\text{Ci/m}^3}$$

Skin Dose at 500m E

$$1.53\ E5\ \frac{\text{mRem/hr}}{\text{Ci/m}^3} \times 1.38\ E{-}5\ \text{Ci/m}^3 \times 2\ \text{hr} = 4.2\ \text{mRem (as of 10/00} = 1.8\ \text{mRem)}$$

## Ground Level Release at EAB

Worst Case $\frac{X}{Q}$ for 2 hrs at 338m NE or 338m SSE, using Regulatory Guide 1.25

$2.2\ E{-}3\ \frac{\text{sec}}{\text{m}^3}$

| Whole Body Dose at 338m | Skin Dose at 338m |
|---|---|
| 10/87 = 0.49 mRem | 10/87 = 40.4 mRem |
| 10/00 = 0.21 mRem | 10/00 = 17.5 mRem |

## Ground Level Release at Emergency Planning Zone Boundary

Worst Case $\frac{X}{Q}$ for 2 hrs at 100m E

$1.02\ E{-}2\ \frac{\text{sec}}{\text{m}^3}$

| Whole Body Dose at 100m E | Skin Dose at 100m E |
|---|---|
| 10/87 = 2.25 mRem | 10/87 = 187 mRem |
| 10/00 = 0.97 mRem | 10/00 = 80.8 mRem |

As can be seen, the estimated maximum whole body dose is more than a factor of 11,000 below the 10 CFR 100 dose limit of 25 Rem (25,000 mRem) to the whole body within a 2-hour period.

## 9.3 SHIPPING CASK OR HEAVY LOAD DROP INTO FESW

This accident postulates a shipping cask or other heavy load falling into the Fuel Element Storage Well. Reference 1 stated that extensive local rack deformation and fuel damage would occur during a cask drop accident, but with an additional plate (installed during the reracking) in place, a dropped cask would not damage the pool liner or floor sufficiently to adversely affect the leak-tight integrity of the storage well (i.e., would not cause excessive water leakage from the FESW).

For this accident, it is postulated that all 333 spent fuel assemblies located in the FESW are damaged. The cladding of all the fuel pins ruptures. The same assumptions used in the Spent Fuel Handling Accident (Section 9.2) are used here. A total of 35,760 Curies of Kr-85 is released within the 2-hour period. The doses calculated are as follows. (Due to decay, as of Oct. 2000 only 43.2% of the Kr-85 activity remains - 15,448 Curies.)

**Elevated Release**

| Whole Body Dose at 500m E | Skin Dose at 500m E |
|---|---|
| 10/87 = 4.2 mRem | 10/87 = 350 mRem |
| 10/00 = 1.8 mRem | 10/00 = 151.2 mRem |

**Ground Level Release at EAB**

| Whole Body Dose at 338m | Skin Dose at 338m |
|---|---|
| 10/87 = 40.2 mRem | 10/87 = 3.34 Rem |
| 10/00 = 17.4 mRem | 10/00 = 1.44 Rem |

**Ground Level Release at Emergency Planning Zone Boundary**

| Whole Body Dose at 100m E | Skin Dose at 100m E |
|---|---|
| 10/87 = 186 mRem | 10/87 = 15.6 Rem |
| 10/00 = 80.4 mRem | 10/00 = 6.7 Rem |

As can be seen, the estimated offsite doses for the cask drop accident are below the 10 CFR 100 limits. The postulated maximum whole body dose is more than a factor of 100 below the 10 CFR 100 limit of 25 Rem (25,000 mRem).

# LACBWR

# INITIAL

# SITE CHARACTERIZATION SURVEY

# FOR SAFSTOR

By:

Larry Nelson
Health and Safety Supervisor

October 1995

Revised: January 2001

Dairyland Power Cooperative
3200 East Avenue South
La Crosse, WI 54601

PLANT LOOSE SURFACE CONTAMINATION - JANUARY 1988

| Location | Isotopes Present, in µCi | | | | | | | Total Area µCi Content |
|---|---|---|---|---|---|---|---|---|
| | Co-60 | Cs-137 | Mn-54 | Ce-144 | Co-57 | Cs-134 | Fe-55 | |
| **Turbine Building (TB)** | | | | | | | | |
| a) Main Floor | 0.83 | 0.07 | -- | -- | -- | -- | 0.83 | 1.73 |
| b) Mezzanine - including stop valve area | 0.49 | 0.14 | 0.04 | -- | -- | -- | 0.49 | 1.16 |
| c) Grade Floor - includes feedwater heater area | 0.42 | 0.06 | 0.02 | | | | 0.42 | 0.92 |
| d) Tunnel | 0.81 | 0.18 | 0.06 | -- | -- | -- | 0.81 | 1.86 |
| **Containment Building (CB)** | | | | | | | | |
| a) Above grade | 3.16 | 0.2 | 0.39 | -- | -- | -- | 3.16 | 6.91 |
| b) Below grade | 31.44 | 7.40 | 2.36 | 0.04 | 0.04 | 0.08 | 31.44 | 72.80 |
| **Waste Treatment Building** | 7.57 | 0.48 | 0.66 | -- | -- | -- | 7.57 | 16.28 |
| Totals | 44.72 | 8.53 | 3.53 | 0.04 | 0.04 | 0.08 | 44.72 | 101.66 |

PLANT SYSTEMS INTERNAL RADIONUCLIDE INVENTORY - JANUARY 1988 - (cont'd)

| Plant System | Nuclide Activity, in µCi | | | | | | | | System Total µCi Content |
|---|---|---|---|---|---|---|---|---|---|
| | Fe-55 | Alpha | Co-60 | Mn-54 | Cs-137 | Ce-144 | Zn-65 | Other | |
| Fuel Element Storage Well System | 8.5 E5 | 3.9 E2 | 8.5 E5 | 1.4 E4 | -- | 1.0 E4 | -- | | 1.7 E6 |
| Fuel Element Storage Well - all but floor | 1.3 E3 | 4.9 | 1.3 E3 | 6.0 E2 | 4.6 E3 | -- | 4.5 E2 | | 8.3 E3 |
| Fuel Element Storage Well floor | 2.6 E7 | 7.6 E3 | 2.6 E7 | 5.0 E5 | 4.1 E4 | -- | 1.1 E5 | Cs-134 = 1.3 E2<br>Co-58 = 1.3 E2 | 5.3 E7 |
| Resin Lines | 1.3 E5 | 1.0 E2 | 1.3 E5 | 4.2 E4 | -- | 4.0 E2 | 2.2 E3 | Fe-59 = 1.7 E3<br>Co-57 = 4.8 E1<br>Co-58 = 2.1 E3<br>Nb-95 = 3.5 E2<br>Ru-103 = 1.6 E2 | 3.1 E5 |
| Main Condenser | 1.1 E7 | 8.5 E3 | 1.1 E7 | 3.6 E6 | -- | 3.4 E4 | 1.9 E5 | Fe-59 = 1.4 E5<br>Co-57 = 4.1 E3<br>Co-58 = 1.7 E5<br>Nb-95 = 3.0 E4<br>Ru-103 = 1.4 E4 | 2.6 E7 |

NOTE: Attachment 3 is an inventory of the plant system - Internal Radionuclide Inventory decay corrected.

ATTACHMENT 1

## SPENT FUEL RADIOACTIVITY INVENTORY

Decay-Corrected to January 2001

| Radionuclide | Half Life (Years) | Activity (Curies) | Radionuclide | Half Life (Years) | (Curies) |
|---|---|---|---|---|---|
| Ce-144 | 7.801 E-1 | 25.4 | Sr-90 | 2.770 E + 1 | 8.29E5 |
| Cs-137 | 3.014 E+1 | 1.24E6 | Pu-241 | 1.440 E+1 | 6.09E5 |
| Ru-106 | 1.008 E+0 | 200 | Fe-55 | 2.700 E+0 | 1.87E4 |
| Cs-134 | 2.070 E+0 | 4.24E3 | Ni-59 | 8.000 E+4 | 2.87E2 |
| Kr-85 | 1.072 E+1 | 5.01E4 | Tc-99 | 2.120 E+5 | 2.76E2 |
| Ag-110m | 6.990 E-1 | 2.57E-1 | Sb-125 | 2.760 E+0 | 10.4 |
| Co-60 | 5.270 E+0 | 1.16E4 | Eu-155 | 4.960 E+0 | 27.3 |
| Pm-147 | 2.620 E+0 | 1.33E3 | U-234 | 2.440 E+5 | 63.7 |
| Ni-63 | 1.000 E+2 | 3.24E4 | Am-243 | 7.380 E+3 | 63.0 |
| Am-241 | 4.329 E+2 | 1.44E4 | Cd-113m | 1.359 E+1 | 9.2 |
| Pu-238 | 8.774 E+1 | 1.14E4 | Nb-94 | 2.000 E+4 | 15.9 |
| Pu-239 | 2.410 E+4 | 8.83E3 | Cs-135 | 3.000 E+6 | 14.0 |
| Pu-240 | 6.550 E+3 | 7.16E3 | U-238 | 4.470 E+9 | 12.2 |
| Eu-154 | 8.750 E+0 | 1.44E3 | Pu-242 | 3.760 E+5 | 8.6 |
| Cm-244 | 1.812 E+1 | 2.19E3 | U-236 | 2.340 E+7 | 6.3 |
| H-3 | 1.226 E+1 | 2.64E2 | Sn-121m | 7.600 E+1 | 3.9 |
| Eu-152 | 1.360 E+1 | 2.63E2 | Np-237 | 2.140 E+6 | 2.2 |
| Am-242m | 1.505 E+2 | 4.62E2 | U-235 | 7.040 E+8 | 1.9 |
| | | | Sm-151 | 9.316 E+1 | 1.4 |
| | | | Sn-126 | 1.000 E+5 | 0.70 |
| | | | Se-79 | 6.500 E+4 | 0.55 |
| | | | I-129 | 1.570 E+7 | 0.39 |
| | | | Zr-93 | 1.500 E+6 | 0.11 |

Total Activity = 2.84 E6 Curies

ATTACHMENT 2

CORE INTERNAL/RX COMPONENT RADIONUCLIDE INVENTORY - JANUARY 2001

| Components | Estimated Curie Content | | | | |
|---|---|---|---|---|---|
| | Co-60 | Fe-55 | Ni-63 | Other Nuclides $T_{1/2} > 5y$ | Total |
| **In Reactor** | | | | | |
| Fuel Shrouds (72 Zr, 8 SS) | 4,002 | 2,248 | 1,236 | 8 | 7,494 |
| Control Rods (29) | 884 | 172 | 747 | 8 | 1,811 |
| Core Vertical Posts (52) | 230 | 21 | 58 | 2 | 311 |
| Core Lateral Support Structure | 1,649 | 764 | 704 | 4 | 3,121 |
| Steam Separators (16) | 6,052 | 2,804 | 2,583 | 15 | 11,454 |
| Thermal Shield | 261 | 121 | 112 | 0.5 | 495 |
| Pressure Vessel | 63 | 37 | 9 | -- | 109 |
| Core Support Structure | 1,169 | 542 | 499 | 3 | 2,210 |
| Horizontal Grid Bars (7) | 31 | 15 | 14 | -- | 60 |
| Incore Monitor Guide Tubes | 56 | 7 | 558 | 3 | 624 |
| Total | 14,397 | 6,731 | 6,520 | 43.5 | 27,692 |
| **In FESW** | | | | | |
| Fuel Shrouds (24 SS) | 2,474 | 533 | 2,179 | 13 | 5,199 |
| Fuel Shrouds (73 Zr) | 166 | 36 | 87 | 2 | 291 |
| Control Rods (10) | 626 | 85 | 832 | 9 | 1,552 |
| Start-up Sources (2) | 575 | 81 | 143 | 2 | 801 |
| Total | 3,841 | 735 | 3,241 | 26 | 7,843 |

ATTACHMENT 3

PLANT SYSTEMS INTERNAL RADIONUCLIDE INVENTORY - JANUARY 2001

| Plant System | Nuclide Activity, in µCi | | | | System Total µCi Content |
|---|---|---|---|---|---|
| | Fe-55 | Alpha | Co-60 | Cs-137 | |
| CB Ventilation | 57.6 | -- | 289.6 | 126.2 | 473.4 |
| Offgas - upstream of filters | *SYSTEM* | *REMOVED* | | | |
| Offgas - downstream of filters | *SYSTEM* | *REMOVED* | | | |
| TB drains | 612 | 4.0 E1 | 3,077 | 3,713 | 7,442 |
| CB drains | 1,368 | 3.2 | 6,878 | 1,782 | 10,031 |
| TB Waste Water | 129.6 | 6.8 | 651.6 | 89.1 | 877.1 |
| CB Waste Water | 7,560 | 7.9 E1 | 38,010 | 1,708 | 47,357 |
| Main Steam | 9,360 | 2.9 E2 | 47,060 | | 56,710 |
| Turbine | 33.5 | 1.8 | 168.3 | 148.5 | 352.1 |
| Primary Purification | 3,204 | 1.2 E1 | 16,109 | | 19,325 |
| Emergency Core Spray | *SYSTEM* | *REMOVED* | | | |
| Overhead Storage Tank | 468 | 3.4 E1 | 2,353 | 579 | 3,434 |
| Seal Inject | 57.6 | 3.8 | 289.6 | 40.8 | 391.8 |

ATTACHMENT 3

PLANT SYSTEMS INTERNAL RADIONUCLIDE INVENTORY - JANUARY 2001 - (cont'd)

| Plant System | Nuclide Activity, in µCi | | | | System Total µCi Content |
|---|---|---|---|---|---|
| | Fe-55 | Alpha | Co-60 | Mn-54 | |
| Decay Heat | 3,600 | 4.9 E2 | 18,100 | 1.0 | 22,191 |
| Boron Inject | *SYSTEM* | *REMOVED* | | | |
| Reactor Coolant PASS | *SYSTEM* | *REMOVED* | | | |
| Alternate Core Spray | 720 | 9.4 E1 | 3,620 | | 4,434 |
| Shutdown Condenser | *SYSTEM* | *REMOVED* | | | |
| Control Rod Drive Effluent | 5,400 | 7.2 E2 | 27,150 | 1.3 | 33,271 |
| Forced Circulation | 54,000 | 7.0 E3 | 271,500 | 12 | 332,512 |
| Reactor Vessel and Internals | 90,000 | 1.2 E4 | 452,500 | 20.7 | 554,921 |
| Condensate after beds & Feedwater | 7,560 | 2.8 E2 | 38,010 | 1.0 | 45,851 |
| Condensate to beds | 1,404 | 3.1 E1 | 7,059 | | 8,494 |

ATTACHMENT 3

PLANT SYSTEMS INTERNAL RADIONUCLIDE INVENTORY - JANUARY 2001 - (cont'd)

| Plant System | Nuclide Activity, in μCi | | | | | | System Total μCi Content |
|---|---|---|---|---|---|---|---|
| | Fe-55 | Alpha | Co-60 | Mn-54 | Cs-137 | Cs-134 | |
| Fuel Element Storage Well System | 30,600 | 3.9 E2 | 153,850 | | | | 184,840 |
| Fuel Element Storage Well - all but floor | 46.8 | 4.9 | 235.3 | | 3,416 | | 703 |
| Fuel Element Storage Well floor | 936,000 | 7.6 E3 | 4,706,000 | 13.6 | 30,446 | 1.6 | 5,680,061 |
| Resin lines | 4,680 | 1.0 E2 | 23,530 | 1.1 | | | 28,311 |
| Main Condenser | 396,000 | 8.5 E3 | 1,991,000 | 98.1 | | | 2,395,598 |